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CENTRAL INTELLIGENCE AGENCY REPORT [redacted]

INFORMATION REPORT

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COUNTRY USSR

DATE DISTR. 20 June 1951

SUBJECT Technical Examination of Soviet Steel Wire

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SUPPLEMENT TO REPORT NO.

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1. The sample is described as an eight-inch length of wire 0.255" in diameter. The surface was fairly bright but contained many fine pits. A fairly heavy longitudinal die scratch was found on one side and the surface contained a number of dents as though the wire had been pounded in service. /Available on loan from the CIA Library is a photograph, at five power magnification, of the sample./

2. The tensile strength of the steel wire sample was determined to be 95,000 pounds per square inch.

3. Chemical analysis of the sample has revealed the following composition:

C	Mn	P	S	Si	Cr	Ni	Mo	Cr	Sn	Pb
.08	4.23	.031	.024	.39	20.39	9.49	.08	.16	.012	.006

Co	W	Fe
.09	Trace	to make 100%

4. Micro-examination has revealed the following concerning the structure of the sample:

   a. Structure was equimaxed austenite grains of A.S.T.M. sizes Number 6 and 7.

   b. There was no evidence of precipitated carbides.

   c. Many very small chromium aluminate inclusions and a few chromium silicate inclusions were found.

      (1) These inclusions are typical of aluminum deoxidized steel.

5. Conclusions drawn from this examination are as follows:

   a. The composition of the sample conforms closely to that of USA stainless steel type 307, which is normally made within the following composition limits:

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C .07-.15	S .03 maximum	Ni 9.0-10.5
Mn 3.75-4.75	Si .25-.60	Fe to make 100%
P .04 maximum	Cr 19.5-21.5	

b. The quantities of "tramp" molybdenum, copper, tin, lead, cobalt, and tungsten found in the sample are within normal limits for USA type 307 stainless steel.

c. The quality and grain size of the material were normal by US standards.

(1) The structure and tensile strength correspond to a stainless steel in annealed condition or annealed and lightly cold drawn. It is estimated that drawing was not carried beyond 5 per cent reduction of area.

d. The pits on the wire surface suggest that at some stage in its production the wire was heavily scaled and suffered some inter-granular oxidation.

e. The use to which this wire was put at the site of its acquisition is not clear.

(1) Type 307 stainless steel is customarily employed in the USA as a core wire for coated, welding electrodes used to weld high-strength, low-alloy steels. This type of electrode has been widely used in the USA for welds on armored vehicles. The sample showed no evidence of flux coating, however, and may have been used for some other purpose.

(2) The sample is not desirable by USA standards for use as high-tension electrical conductor.

(3) Steel of this type would not normally be used in the USA for high-tensile strength applications. Instead, USA practice would call for steels of type 302 or 304.

(4) The strength of the sample falls well below 175,000 psi which is normally a limit in USA practice for 0.250" diameter spring wire.

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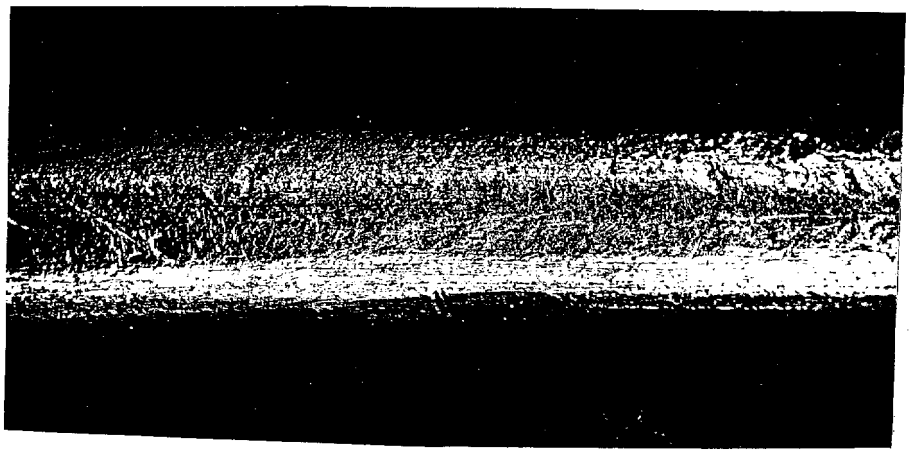
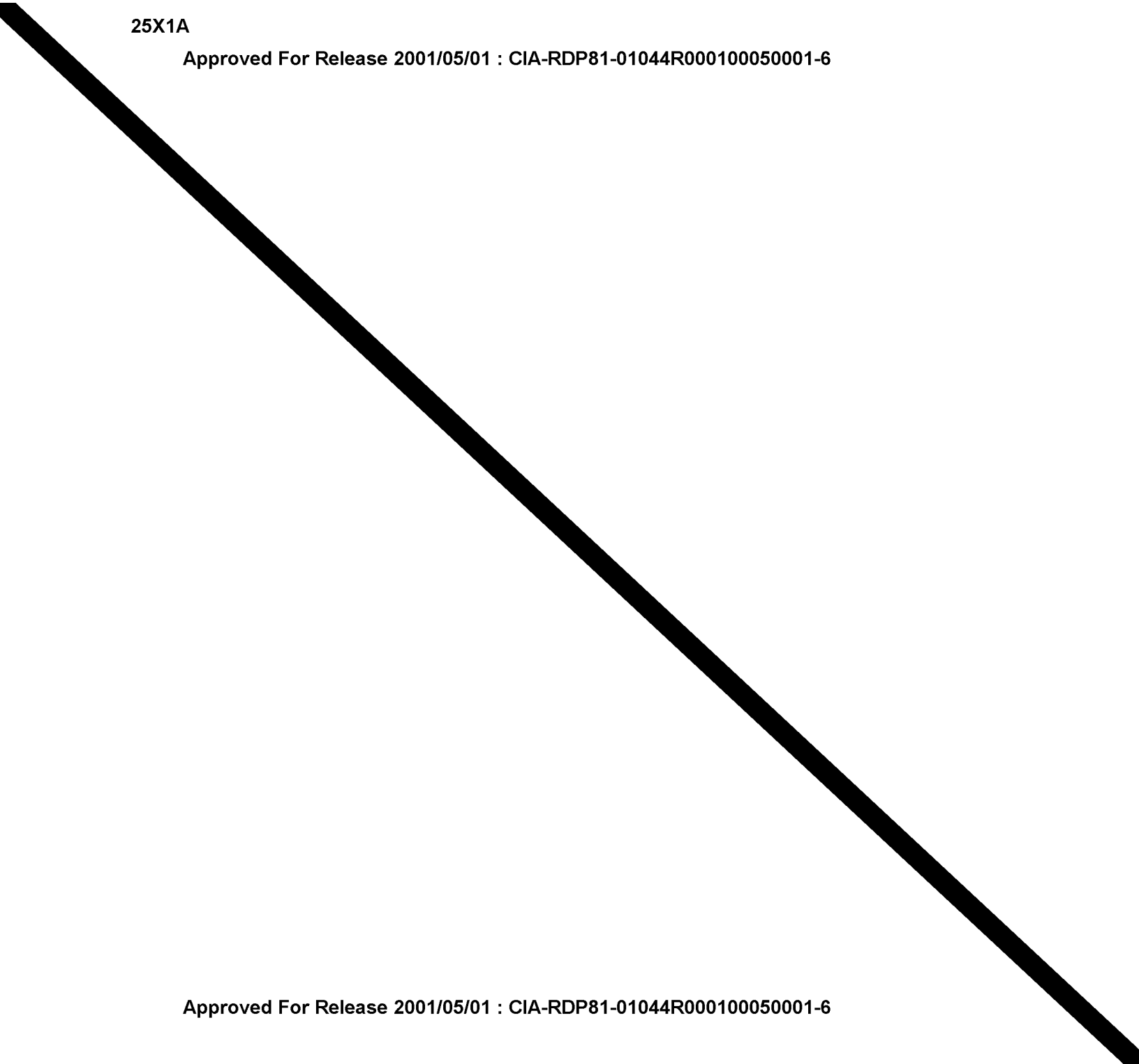


Figure 6. High Tension Wire Magnification 5 X



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